

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An electric filter comprising a plurality of thin film bulk acoustic resonators (FBARs) linked in a series/parallel arrangement wherein:

each resonator is made up of a thin piezoelectric layer made of a piezoelectric material and sandwiched between two metal ~~electrodes~~electrodes, and other layers of materials;

the thicknesses of the non-piezoelectric layers in the FBARs in the filter are varied one-from another;

the filter has two close-in rejections, at least one of which is deeper as compared with a case where the thicknesses of respective layers in the FBARs are the same among all the FBARs; and

the piezoelectric material is substantially lead scandium tantalum oxide.

2. (Original) An electric filter as described in claim 1, wherein the piezoelectric sandwich structure is supported on a thin membrane layer.

3. (Original) An electric filter as described in claim 1, wherein the piezoelectric sandwiched structure is supported on an acoustic reflective stack.

4. (Previously Presented) An electric filter as described in claim 1, wherein the layer whose thickness is varied from one FBAR to another is the top electrode.

5. (Previously Presented) An electric filter as described in claim 1, wherein the layer whose thickness is varied from one FBAR to another is the bottom electrode.

6. (Previously Presented) An electric filter as described in claim 1, wherein the layer whose thickness is varied from one FBAR to another is an underlying membrane.

7. (Previously Presented) An electric filter as described in claim 1, wherein the layer whose thickness is varied from one FBAR to another is an overlying dielectric layer.

8. (Previously Presented) An electric filter as described in claim 1, wherein the layer whose thickness is varied from one FBAR to another is an overlying metal layer.

9. (Cancel)

10. (Cancel)

11. (Cancel)

12. (Cancel)

13. (Cancel)

14. (Previously Presented) An electric filter as described in claim 1, wherein the metal electrodes are substantially gold.

15. (Previously Presented) An electric filter as described in claim 1, wherein the metal electrodes are substantially aluminum.

16. (Previously Presented) An electric filter as described in claim 1, wherein the metal electrodes are substantially platinum.

17. (Original) An electric filter as described in claim 6, wherein the underlying membrane is silicon nitride.

18. (Original) An electric filter as described in claim 6, wherein the underlying membrane is silicon oxide.

19. (Currently Amended) An electric filter as described in claim 7, wherein the ~~overlying~~ overlying dielectric layer is silicon nitride.

20. (Currently Amended) An electric filter as described in claim 7, wherein the ~~overlying~~ overlying dielectric layer is silicon oxide.

21. (Previously Presented) An electric filter as described in claim 1, wherein the variation in the thickness of one of the layers is produced by etching by excimer laser pulses.

22. (Previously Presented) An electric filter as described in claim 1, wherein the variation in the thickness of one of the layers is produced by wet etching.

23. (Previously Presented) An electric filter as described in claim 1, wherein the variation in the thickness of one of the layers is produced by ion milling.

24. (Previously Presented) An electric filter as described in claim 1, wherein the variation in the thickness of one of the layers is produced by reactive ion etching.

25. (Currently Amended) An electric filter comprising at least one FBAR in series and at least one FBAR in parallel, each FBAR having a piezoelectric layer made of a piezoelectric material and sandwiched between two ~~electrodes~~electrodes, wherein:

the thicknesses of one or more non-piezoelectric layers in the series FBAR are different from those in the parallel FBAR;

the filter has two close-in rejections, at least one of which is deeper as compared with a case where the thicknesses of respective layers in the FBARs are the same among all the FBARs; and

the piezoelectric material is substantially lead scandium tantalum oxide.

26. (Original) An electric filter according to claim 25, wherein the thickness of at least one electrode is different between the FBAR in series and the FBAR in parallel.

27. (Previously Presented) An electric filter according to claim 25, wherein at least one additional layer is provided over the top electrode or under the bottom electrode.

28. (Previously Presented) An electric filter according to claim 27 wherein the thickness of the additional layer is different between the FBAR in series and the FBAR in parallel.

29. (Previously Presented) An electric filter according to claim 1 comprising a plurality of FBARs linked in series and a plurality of FBARs linked in parallel.

30. (Cancelled)

31. (Previously Presented) An electric filter comprising a plurality of thin film bulk acoustic resonators (FBARs) linked in a series/parallel arrangement wherein:
- each resonator is made up of a thin piezoelectric layer made of a piezoelectric material and sandwiched between two metal electrodes, and other layers of materials;
 - the thicknesses of the non-piezoelectric layers in the FBARs in the filter are varied one from another;
 - the filter has a lower minimum insertion loss in a band pass area as compared with a case where the thicknesses of respective layers in the FBARs are the same among all the FBARs; and
 - the piezoelectric material is substantially lead scandium tantalum oxide.
32. (Previously Presented) An electric filter as described in claim 31, wherein the piezoelectric sandwich structure is supported on a thin membrane layer.
33. (Previously Presented) An electric filter as described in claim 31, wherein the piezoelectric sandwiched structure is supported on an acoustic reflective stack.
34. (Previously Presented) An electric filter as described in claim 31, wherein the layer whose thickness is varied from one FBAR to another is the top electrode.
35. (Previously Presented) An electric filter as described in claim 31, wherein the layer whose thickness is varied from one FBAR to another is the bottom electrode.
36. (Previously Presented) An electric filter as described in claim 31, wherein the layer whose thickness is varied from one FBAR to another is an underlying membrane.
37. (Previously Presented) An electric filter as described in claim 31, wherein the layer whose thickness is varied from one FBAR to another is an overlying dielectric layer.
38. (Previously Presented) An electric filter as described in claim 31, wherein the layer whose thickness is varied from one FBAR to another is an overlying metal layer.
39. (Cancel)

- 40. (Cancel)
- 41. (Cancel)
- 42. (Cancel)
- 43. (Cancel)
- 44. (Previously Presented) An electric filter as described in claim 31, wherein the metal electrodes are substantially gold.
- 45. (Previously Presented) An electric filter as described in claim 31, wherein the metal electrodes are substantially aluminum.
- 46. (Previously Presented) An electric filter as described in claim 31, wherein the metal electrodes are substantially platinum.
- 47. (Previously Presented) An electric filter as described in claim 36, wherein the underlying membrane is silicon nitride.
- 48. (Previously Presented) An electric filter as described in claim 36, wherein the underlying membrane is silicon oxide.
- 49. (Previously Presented) An electric filter as described in claim 37, wherein the overlying dielectric layer is silicon nitride.
- 50. (Previously Presented) An electric filter as described in claim 37, wherein the overlying dielectric layer is silicon nitride.
- 51. (Previously Presented) An electric filter as described in claim 31, wherein the variation in the thickness of one of the layers is produced by etching by excimer laser pulses.
- 52. (Previously Presented) An electric filter as described in claim 31, wherein the variation in the thickness of one of the layers is produced by wet etching.
- 53. (Previously Presented) An electric filter as described in claim 31, wherein the variation in the thickness of one of the layers is produced by ion milling.

54. (Previously Presented) An electric filter as described in claim 31, wherein the variation in the thickness of one of the layers is produced by reactive ion etching.

55. (Previously Presented) An electric filter comprising at least one FBAR in series and at least one FBAR in parallel, each FBAR having a piezoelectric layer made of a piezoelectric material and sandwiched between two electrodes, wherein:

the thicknesses of one or more non-piezoelectric layers in the series FBAR are different from those in the parallel FBAR;

the filter has a lower minimum insertion loss in a band pass area as compared with a case where the thicknesses of respective layers in the FBARs are the same among all the FBARs; and

the piezoelectric material is substantially lead scandium tantalum oxide.

56. (Previously Presented) An electric filter according to claim 55, wherein the thickness of at least one electrode is different between the FBAR in series and the FBAR in parallel.

57. (Previously Presented) An electric filter according to claim 55, wherein at least one additional layer is provided over the top electrode or under the bottom electrode.

58. (Previously Presented) An electric filter according to claim 57 wherein the thickness of the additional layer is different between the FBAR in series and the FBAR in parallel.

59. (Previously Presented) An electric filter according to claim 31, comprising a plurality of FBARs linked in series and a plurality of FBARs linked in parallel.